

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 83686

83686

Page 2

April-23-12 3:57:41 PM

Item ID: D6104-005 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Round Billet, 17-4
 Start Date: 23/04/2012 Start Qty: 12.00 ***12*** Cust Item ID:
 Required Date: 07/05/2012 Req'd Qty: 12.00 ***12*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Identify as per dwg & Stock Location: <u>CNC</u>	0.00							
130									
Packaging	Memo	0.00		12/5/2		12			
Packaging									
140	QC21- Final Inspection - Work Order Release	0.00							
140									
QC	Memo	0.00							12/5/3 20
Quality Control									

1205-2

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NOTE: Date & initial all entries

Picklist Print

April-23-12 3:57:45 PM

Page 1

Work Order ID: 83686

83686

Parent Item: D6104-005

D6104-005

Parent Item Name: Round Billet, 17-4

Start Date: 23/04/2012

Required Date: 07/05/2012

Start Qty: 12.00

Required Qty: 12.00

Comments: IPP A: 01.05.08New Issue EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6104-005P		Purchased	No			110	Each	0.0000	1	12			

D6104-005P

17-4 SS Roundbar 4.00"OD

**

4/25/12 (12)

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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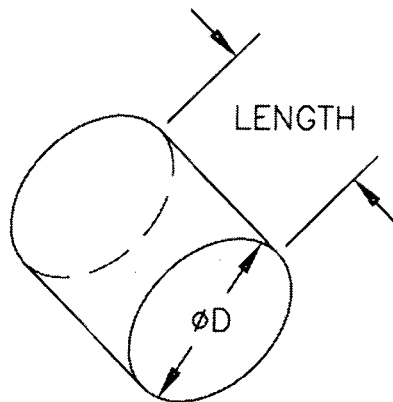


DESIGN F.P.	DRAWN BY 	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED 	APPROVED 	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29

SPECIFICATION CONTROL DRAWING



SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 83686 MCJ
12/04/24

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRC)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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**Castle Metals®**

A. M. Castle & Co.

PACKING SLIP/
CERTIFICATE OF CONFORMANCE

Page 1 of 1

Shipment No:1290876

Ship From: A. M. Castle & Co. (Canada) Inc. MONTREAL 835-SELKIRK AVENUE POINTE CLAIRE, QUEBEC H9R 3S2		Sold To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA		Ship To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CAN		Deliver To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA			
Date Shipped 30-APR-2012		F.O.B. ORIGIN		Freight Terms Prepaid		Carrier MANITOULIN		BOL No 1290876-2	

Shipment Details				Final Destination Branch - MON			
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Order No 2157373		Line No 2		Item No 42464.MO		Description 4.0000.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.132.0000-156.0000 CUT TO 5.1 IN (+ .0620/- .0000 IN) - BAND SAW CUTTING SPECIFICATIONS: AMS 5643									
Purchase Order No 16815				Part Number YOUR ITEM NUMBER: D6104-005				Ordered Qty 12.00 PCS		Invoice Qty 12.00 PCS					
Details		Mill		Heat Number		Mech Id		PCS		Width (IN)		Length (IN)		Shipped Qty(LBS)	
Delivery No. 117577647				524906				12						224.75	

These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.	
We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.	
Reviewed by Authorized Castle Metals Representative:	Date: Name:



Certificate of Test

HEAT 524906 ORDER 614277/ 01 BOL 0207899 * CERTIFICATION * 07/20/10

SHIP TO:
A. M. CASTLE & CO.
26800 MILES ROAD
216-292-7600
BEDFORD HEIGHTS

441460000

----- YOUR ORDER & DATE -----
62974 7/20/10 CUST# 0254001 CUST TAG#42464

----- ITEM DESCRIPTION -----
GRADE 17-4 Ship Condition CONDA
Size 17-4 RND HRART CONDA 4.0000 x 144.000 RL
Country of Melt: SWEDEN Country of Mfg.: UNITED STATES
NAFTA Country of Origin is Country of Melt

No weld repair
Free of mercury contamination, Free of radiation contamination
No WEEE relevant substances; Meets EU electrical ROHS

Total Bundles 4 Total Weight 9775

WO 2009432 Bundles: 1B, 1C, 1D, 1E

----- SPECIFICATIONS -----
MFG. TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED SWEDEN
AMS 2303E AMS 5643R
ASME SA182 E07 A07, A08 & A09 ASME SA564 E07
ASTM A484 09 ASTM A564 04 Type 630
DFARS 252.225.7014 6/05 Reduction Ratio 3:1 minimum
UNS S17400, AISI 630 No weld repair
Free of Mercury Contamination AM Castle 3174-10 R8

----- MECHANICAL & OTHER TESTS -----
Hardness as shipped 294 HB Hardness as tested 400 HB
Hardness as shipped 031 HRC Hardness as tested (43 HRC)
Grain size 6.0 Tensile strength, KSI (MPa) 190.0 (1310)
Micro OK 0.2% Yield Strngth, KSI (MPa) 175.0 (1207)
Intergranular corrosion
Macro OK Elongation % in 4D 14.0
Reduction of area % 46.0
Charpy (ft lb) 0 0 0 Avg 94

Ferrite 1.0

----- CHEMICAL COMPOSITION -----
Carbon (C) .012 Manganese (Mn) .730
Phosphorus (P) .021 Sulphur (S) .025
Silicon (Si) .390 Chromium (Cr) 15.350
Nickel (Ni) 4.710 Cobalt (Co) .034
Copper (Cu) 3.270 Moly (Mo) .170
Nitrogen (N) .021 Columbium (Cb) .350
Titanium (Ti) .005 Aluminum (Al) .003
Tin (Sn) .005 Cerium (Ce) .010
Boron (B) .001 Tantalum (Ta) .005
Vanadium (V) .051
Columbium/ Tantalum (Cb+Ta) .355
Iron (Fe) Balance Severity .000
Frequency .000
Melt Practice EAF
Refining Practice AOD
De-long Ferrite

Knowingly & willfully falsifying or concealing a material act on this form, or making false, fictitious or fraudulent statements or representations herein could constitute a felony punishable under federal statutes. We hereby certify that the test results shown in this report are correct and accurate as contained in the records of the company and are in compliance with the specifications, codes, and standards listed above.

M.F. Marcanio, Quality Manager

CASTLE METALS - CLE

HEAT NUMBER	524906
MECHANICAL ID	
ITEM CODE	
LOT NUMBER	42464
PO NUMBER	651615
RECEIPT DATE	62974
SUPPLIER	7-22-10
LCS	Outokumpu
COMMENT	
APPROVED	KT